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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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*Ex parte* ORAN D. TARLTON

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Appeal 2008-0340
Application 09/369,134
Technology Center 3600

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Decided: March 14, 2 008

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*Before:* MURRIEL E. CRAWFORD, HUBERT C. LORIN and STEVEN D.A. McCARTHY, *Administrative Patent Judges*.

McCARTHY, *Administrative Patent Judge*.

## DECISION ON APPEAL

### STATEMENT OF THE CASE

The Appellant appeals under 35 U.S.C. § 134 (2002) from the final rejection of claims 3, 4, 6, 10, 11, 13, 21 and 25 under 35 U.S.C. § 103(a) (2002) as being unpatentable over Fyffe (U.S. Patent 1,426,724) in view of Ogino (U.S. Patent 5,651,494); and the final rejection of claims 5, 7, 12, 14,

22-24 and 26 under section 103(a) as being unpatentable over Fyffe in view of Ogino and Poe (U.S. Patent 4,563,025). Independent claim 4 is representative of the Appellant's claims and reads as follows:

> 4. A composite metal seal comprising a core of relatively hard metal, and at least one annular region of relatively soft metal that is integrally bonded with the core of relatively hard metal and that provides an annular sealing surface for effecting a fluid pressure seal, wherein the annual [*sic*, annular] region of relatively soft metal is welded onto the core of relatively hard metal.

We have jurisdiction under 35 U.S.C. § 6(b) (2002).

We reverse.

The primary issue in this appeal is whether the combined teachings of Fyffe and Ogino would have suggested a composite metal seal ring having one or more annular regions of relatively soft metal welded onto an annular core of relatively hard metal. Fyffe teaches collars for joining metal pipes. (Fyffe, ll. 9-10). Referring to Fig. 1 of the reference, each of the collars *a* and *b* has a threaded end which fits over an end of one of the pipes *g* and *j* as well as a flared end axially opposite the threaded end. An internal core *c* of hard metal fits into a cavity formed by the flared ends of the collars *a* and *b*. (Fyffe, ll. 35-38 and Fig. 1). A seating *d* of soft metal mates with the external surface of the core *c* and is gripped by the interior surface of the flared end of the collar *a*. Another seating *d* of soft metal mates with the external surface of the core *c* and is gripped by the interior surface of the flared end of the collar *b*. (*Id.*; Fyffe, ll. 53-62).

The core *c* appears to be ring-shaped in the sense that it is spherical with a cylindrical interior passageway for allowing fluid to pass between the pipes *g* and *j*. The two seatings *d* appear in Fig. 1 to be annular in shape. "The core is preferably provided with a central rib or stop *h*" which appears to space the two seatings with respect to a longitudinal axis of the core. (Fyffe, ll. 46-47).

Ogino teaches an apparatus for ultrasonically welding a hard metal piece to soft metal pieces. A first soft metal piece lies on a workbench. The hard metal piece lies over the soft metal piece. A layer of metal having high plastic fluidity covers the hard metal piece. A second soft metal piece lies atop the hard metal piece. An ultrasonic vibrator presses a horn tip against the second soft metal piece atop the hard metal piece. (Ogino, col. 2, ll. 26-46). The ultrasonic vibrator vibrates the horn tip laterally. As the horn tip vibrates, the stack of metal pieces is gripped between the horn tip and the workbench. (Ogino, col. 2, ll. 54-60). The lateral vibration of the horn tip causes the soft metal pieces to bond with the layer of metal covering the hard metal piece. (Ogino, col. 2, l. 66 – col. 3, l. 2).

The Examiner finds that:

> Fyffe fails to disclose that the hard and soft metals are integrally bonded together. Ogino discloses integrally bonding of hard metal to soft metal by welding. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the hard metal and soft metal of Fyffe to be welding as taught by Ogino to provide a bond between metals and also to prevent loss of the soft metal from the hard metal (column 1, lines 41-43).

(Ans. 5). With respect to claims 3, 4, 6, 10, 11, 13, 21 and 25, the Appellant contends that:

> In the present application, there is nothing in the prior art of record to suggest the desirability of welding the soft metal to the hard metal in the seal of Fyffe. Fyffe appears to be entirely satisfactory for its intended purpose of making a metal-to-metal fluid pressure seal between two hubs. Moreover, there is nothing in Ogino suggesting that his ultrasonic welding should be used for fabricating a pressure seal. Furthermore, it appears that Ogino's apparatus of FIG. 2 would need to be modified somehow for welding of the hard and soft metal in the seal of Fyffe, due to the fact that Ogino's ultrasonic welding method drives the hard metal into the soft metal, as shown in FIG. 3A and described in column 2 line 66 to column 3 line 4.

(Br. 11). The Examiner responds that "[t]he argument that Ogino fails in 'suggesting that his ultrasonic welding should be used for fabricating a pressure seal' is not persuasive since Ogino is used to teach only that two metals can be welded together to provide a bond between the two metals." (Ans. 8).

We agree with the Appellant that the Examiner has not articulated a sufficient reason why one of ordinary skill in the art would have modified Fyffe's structure in view of the teachings of Fyffe and Ogino. Each of claims 3, 4 and 6 recites that the annular region of soft metal is welded onto the core of relatively hard metal. Each of claims 10, 11, 13, 21 and 25 recites that each of the first and second annular regions of soft metal is welded onto the annular core of relatively hard metal. For the following

reasons, one of ordinary skill in the art would not have looked to Ogino's ultrasonic welding process to integrally bond parts of a fluid pressure sealing ring.

There appear to be several problems with using Ogino's ultrasonic welding process to weld hard and soft metals in a fluid pressure sealing ring. One problem is that Ogino's process is designed for welding hard and soft metals having geometries significantly different from the cores of relatively hard metal and the annular regions of relatively soft metal recited in the claims. Another problem is that close dimensional tolerances appear to be required to fabricate metal-to-metal contact seals capable of withstanding high fluid pressures. As the Appellant points out, one of ordinary skill in the art could not have predicted that Ogino's welding process would produce a usable seal because the process may suffer dimension control problems due to the process driving the core of relatively hard metal into the region of relatively soft metal. (*See* Ogino, col. 2, l. 66 – col. 3, l. 9).

Therefore, we conclude that one of ordinary skill in the art would not have been led to modify Fyffe's structure to include an annular region of soft metal welded onto a core of relatively hard metal as recited in claims 3, 4 and 6 or first and second annular regions of soft metal is welded onto the core of relatively hard metal as recited in claims 10, 11, 13, 21 and 25 given Ogino's welding process. On the record before us, the Appellant has shown that the Examiner erred in rejecting claims 3, 4, 6, 10, 11 and 13.

With respect to claims 5, 7, 12, 14, 22-24 and 26, the Examiner finds that Poe teaches grooves in the surface of a sealing ring "to maintain the integrity of all radial compression to the ring and also to enable the ring to

remain within elastic limit of the seal ring material." (Ans. 6). The Examiner additionally finds that Poe teaches "distribution of stress in a sealed joint by the use of grooves and lands" on the surface of the seal. (Ans. 9). Neither of these teachings overcomes our finding that one of ordinary skill in the art would not have been led to modify Fyffe's structure given Ogino's welding process to arrive at the claimed composite metal seal. On the record before us, the Appellant has shown that the Examiner erred in rejecting claims 5, 7, 12, 14, 22-24 and 26.

## CONCLUSION OF LAW

On the record before us, the Appellant has shown that the combined teachings of Fyffe and Ogino would not have provided one of ordinary skill in the art with reason to modify Fyffe's structure to include one or more annular regions of soft metal welded onto a core of relatively hard metal. Therefore, the Appellant has shown that the Examiner erred in rejecting claims 3, 4, 6, 10, 11, 13, 21 and 25 under section 103(a) as having been obvious from Fyffe in view of Ogino. The Appellant also has shown that the Examiner erred in rejecting claims 5, 7, 12, 14, 22-24 and 26 under section 103(a) as having been obvious from Fyffe in view of Ogino and Poe.

## DECISION

We reverse the Examiner's rejection of claims 3-7, 10-14 and 21-26.

REVERSED

JRG

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